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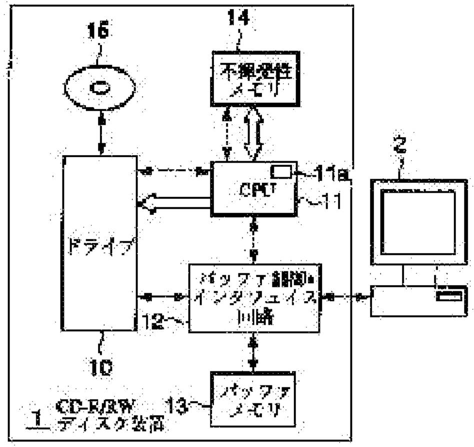
(71)Applicant : **RICOH CO LTD**
(72)Inventor : **NISHINOMIYA MASANOBU**

(54) OPTICAL DISK RECORDING DEVICE AND IMPARTING METHOD OF DEVICE IDENTIFYING INFORMATION TO ITS DEVICE



(57)Abstract:
PROBLEM TO BE SOLVED: To record the device identifying information dispensing with complicated management at the time of manufacture without using a particular device in the manufacturing process of an optical disk recording device.
SOLUTION: A CPU 11 of a CD-R/RW disk device 1 records data for an optical disk 15 based on the instruction from a host computer 2, determines random numbers generated by a random number generating part 11a to be a recorder specific number, stores a RID code (a particular code being intrinsic to every device as the identifying information of an optical disk recording device for specifying the optical disk device illegally recording data in an optical disk from the point of view of protecting the copyright) in a non-volatile memory 14, after recording the data in the optical disk 15 based on the instruction from the host computer 2, the CPU reads out the RID code from the non-volatile memory 14 and writes it in the optical disk 15 by a drive 10.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the grant method of device identification information for optical disk recording devices, such as CD-R / RW device which records data on optical discs, such as CD-R and CD-RW, and the optical disk recording device of those.
[0002]
[Description of the Prior Art]How to encipher that data cannot be unjustly used in recent years because of the copyright protection of the data recorded on the archive medium. (For example, refer to JP,9-54691,A) The device (for example, refer to the Patent Publication Heisei No. 500225 [nine to] gazette) which gives the peculiar information over the archive medium based on the noise of the reading signal from an archive medium is proposed.
[0003]And since the optical disk recording device which recorded data from a viewpoint of copyright protection unjustly to the optical disc is specified also in optical disk recording devices, such as CD-R / RW device, The method which records a peculiar special code for every device as device identification information of the optical disk recording device is proposed.
[0004]When the optical disc which this special code is called the "RID code" and copied illegally in the commercial scene is discovered, It is going to use for an illegal copy person's exposure, and illegal copy prevention by specifying the optical disk recording device used for the illegal copy based on the RID code recorded on the optical disc.
[0005]Three kinds of data in which a RID code is shown below are proposed.
(1) Group 1 : manufacturer code (Manufacturer Code) -- I1, I2, I3 (above, data of 6 bits each)
(2) Group 2 : model code (Type Code) -- I4, I5 (above, data of 6 bits each), I6, I7 (above, data of 4 bits each)
(3) Group 3 : recorder specific number equivalent to device identification information (Recorder Unique Number) -- I8, I9, I10, I11, I12 (above, data of 4 bits each)
[0006]A manufacturer, a model, and a device can be specified by recording the data of the above I1-I12 on the sub-code on an optical disc, or a part of data area, and playing the portion. And although the data as two or more products with same above-mentioned manufacturer code and model code may be given, the recorder specific number must give a different number for every device.
[0007]Then, conventionally, at the time of manufacture of an optical disk recording device, the serial number on the label printed or stuck on the device was read, the device identification information based on the serial number was written in the internal memory, and the optical disk recording device read device identification information in the memory, and was recording it on the optical disc.
[0008]
[Problem(s) to be Solved by the Invention]However, as mentioned above, in order to have read the serial

number on an optical disk recording device and to have recorded the device identification information based on the serial number on the memory inside each device, the special device was needed for the manufacturing process, and there was a problem that the management at the time of manufacture also became complicated.

[0009]For example, if the serial number of a device is written in the memory on the printed circuit board (PCB) of an optical disk recording device as device identification information, In order to make it in agreement with the serial number stuck on the device, when it must be made to have to write in by a final process and fixes, there is also a possibility that both serial numbers may stop being in agreement.

[0010]This invention is made in view of the above-mentioned point, and a special device is not used by a manufacturing process, but the complicated management at the time of manufacture aims at enabling it to record unnecessary device identification information.

[0011]

[Means for Solving the Problem]In an optical disk recording device which connects a host computer and records data to an optical disc based on directions from that host computer in order that this invention may attain the above-mentioned purpose, A random number generation means to generate a random number, a device-identification-information determination means to determine a random number generated by the means as identification information of the device concerned, and a device-identification-information recording device that records device identification information determined by the means on the above-mentioned optical disc are established.

[0012]It is good to make a random number which was made to start generating of a random number of the above-mentioned random number generation means for the above-mentioned device-identification-information determination means with powering on, made suspend generating of a random number of the above-mentioned random number generation means when performing prescribed operation by external operation, and was obtained at the time of the stop into a means to determine as device identification information.

[0013]It is good to make the above-mentioned prescribed operation into disk discharging operation first performed after powering on. Or it is good to make the above-mentioned prescribed operation into disk insertion operation first performed after powering on.

[0014]In an optical disk recording device which connects a host computer and records data to an optical disc based on directions from the host computer, A real-time-information acquisition means which acquires real time information generated with the above-mentioned host computer, It is good to establish a device-identification-information memory measure which memorizes real time information acquired by the means as device identification information of the device concerned, and a device-identification-information recording device which records device identification information memorized by the means on the above-mentioned optical disc. It is good to make the above-mentioned device-identification-information memory measure build in a central processing part which controls the whole device concerned.

[0015]Real time information at the time of manufacture of an optical disk recording device which records data on an optical disc, or an inspection is searched for, and a grant method of device identification information for an optical disk recording device which gives the real time information to the above-mentioned optical disk recording device as device identification information of the above-mentioned optical disk recording device is also provided. In addition, it is good to add information which shows a factory place or an inspecting place of the above-mentioned optical disk recording device to the above-mentioned device identification information.

[0016]An optical disk recording device of claim 1 of this invention, Since a random number is generated, the generated random number is determined as identification information of the device concerned and the determined device identification information is recorded on an optical disc, Since an optical disk recording device records on an optical disc which determines its device identification information and records data, a special device cannot be used by a manufacturing process, but device identification information which does not need complicated management at the time of manufacture can be recorded.

[0017]Since an optical disk recording device of claim 2 of this invention determines a random number which made suspend generating of a random number and was obtained at the time of that stop as device identification information when making generating of a random number start with powering on and performing prescribed operation by external operation, it can ensure random nature of device identification information.

[0018]Since an optical disk recording device of claim 3 of this invention stops generating of a random number at the time of disk discharging operation first performed after powering on, it can determine device identification information by irregular timing called ejection operation of a disk by a user.

[0019]Since an optical disk recording device of claim 4 of this invention stops generating of a random number at the time of disk insertion operation first performed after powering on, it can determine device identification information by irregular timing called inserting operation of a disk by a user further again.

[0020]An optical disk recording device of claim 5 of this invention, Since real time information generated with a host computer connected so that data communications were possible is acquired, the acquired real time information is memorized as device identification information of the device concerned and the device identification information is recorded on an optical disc, Complicated processing which determines device identification information with a random number each time is mitigable.

[0021]Since the whole device concerned was made to build in a central processing part to control, a storage location of device identification information can be made hard to recognize from the outside, and it can avoid changing device identification information unjustly in a function in which an optical disk recording device of claim 6 of this invention memorizes the above-mentioned device identification information.

[0022]A grant method of device identification information for an optical disk recording device of claim 7 of this invention, Since real time information at the time of manufacture of an optical disk recording device which records data on an optical disc, or an inspection is searched for and the real time information is given to an optical disk recording device as device identification information of an optical disk recording device, To an optical disk recording device, a special device cannot be used by a manufacturing process, but device identification information which does not need complicated management at the time of manufacture can be given.

[0023]A grant method of device identification information for an optical disk recording device of claim 8 of this invention, Since information which shows a factory place or an inspecting place of the above-mentioned optical disk recording device is added to the above-mentioned device identification information, when giving device identification information over an optical disk recording device simultaneously at two or more places, what gives the same device identification information can be prevented.

[0024]

[Embodiment of the Invention]Hereafter, this embodiment of the invention is concretely described based on a drawing. Drawing 1 is a block diagram showing the composition of the CD R/RW disk device which is one embodiment of this invention. The dashed line with an arrow in a figure shows a control flow between each part, the solid line with an arrow shows data flow, and the thick line with an arrow shows the flow of a RID code, respectively.

[0025]This CD R/RW disk device 1 is realized by the microcomputer, It connects with the host computer 2 so that data communications are possible, and based on the directions from the host computer 2, the record and playback of data to the optical discs 15, such as CD-R in which ****** is possible, and CD-RW in which rewriting record is possible, are performed.

[0026]At the time of regeneration of the data which CPU11 managed control of this whole device and was specified from the host computer 2. The appointed data is read in the optical disc 15 by the drive 10, Once storing in the buffer memory 13 via buffer control and the interface circuitry 12, by buffer control and the interface circuitry 12, the data stored in the buffer memory 13 is read, and it sends to the host computer 2.

[0027]The data from the host computer 2 is once stored in the buffer memory 13 via buffer control and the interface circuitry 12 at the time of the recording processing of the data sent from the host computer 2. Then, the data stored in the buffer memory 13 by buffer control and the interface circuitry 12 is read, and it sends to the drive 10, and writes in the predetermined record section of the optical disc 15 by the drive 10.

[0028]CPU11 generates the RID code which is self-device identification information based on the random number by which it was generated in the random number generation part 11a, stores it in the nonvolatile memory 14, such as EEPROM, and also performs processing which records the RID code to the optical disc 15. This RID code consists of a manufacturer code, a model code, and a recorder specific number, a manufacturer code and a model code are beforehand stored in the nonvolatile memory 14, and CPU11 creates a recorder specific number itself.

[0029]Namely, in order to realize processing which records a RID code on the optical disc 15, The above-mentioned CPU11 and a random number generation means by which the random number generation part 11a generates a random number, The function of a device-identification-information determination means to determine the random number generated by the means as identification information of the device concerned is achieved, The function of a device-identification-information recording device in which the above-mentioned CPU11, the drive 10, and the nonvolatile memory 14 record the device identification information determined by the device-identification-information determination means on an optical disc is achieved.

[0030]It is good to make the random number which was made to start generating of the random number of the above-mentioned random number generation means with powering on, made suspend generating of the random number of the above-mentioned random number generation means as the above-mentioned device-identification-information determination means when performing prescribed operation by external operation, and was obtained at the time of the stop into a means to determine as device identification information. It is good to make the above-mentioned prescribed operation into the disk insertion operation first performed the disk discharging operation first performed after powering on, or after powering on at the time of the recording operation to a disk.

[0031]On the other hand, the microcomputer which consists of CPU, a ROM, RAM, etc. realizes, and the host computer 2 performs the record and playback of data to the optical disc by the CD R/RW disk device 1.

[0032]Next, the processing which records a RID code on the optical disc in this CD R/RW disk device 1 is explained. Drawing 2 is a flow chart which shows processing when recording a RID code at the time of the data recording over an optical disc.

[0033]If a power supply is turned ON (powering on) at Step (shown in a figure "S") 1, this processing, It progresses to Step 2, and CPU starts generating of the random number by the operation of a random number generation part, and points to the start of initializing operation to a drive, and a drive starts initializing operation, such as rotation of an optical disc, lighting of the laser beam of an optical pickup, and lock on of a servo.

[0034]Progress to Step 3, and CPU supervises operation of a drive and a drive judges whether it is a ready state which shows that preparation of data the record and renewable was completed, [to an optical disc]

If it will be in a ready state, the RID code which progresses to Step 4, suspends generating of a random number, determines the value obtained at the time of the stop as a recorder specific number, progresses to Step 5, and becomes nonvolatile memory from a manufacturer code, a model code, and a recorder specific number is stored.

[0035]It is judged whether it progressed to Step 6 and the record command of data came from the host computer via buffer control and an interface circuitry, If it comes, the data which progresses to Step 7 and is sent from a host computer will once be stored in a buffer memory via buffer control and an interface circuitry, it will send to a drive via buffer control and an interface circuitry, and a drive will write data in an optical disc.

[0036]Progressing to Step 8, CPU reads a RID code from nonvolatile memory, progresses to Step 9, sends a RID code to a drive, by drive, writes a RID code in the prescribed area of an optical disc, and ends processing.

[0037]Thus, this CD R/RW disk device 1, Generate a random number with the power supply ON, and the generated random number is determined as a recorder specific number, Since it memorizes with a manufacturer code and a model code as a RID code which is the identification information of a self-device and a RID code is also recorded on an optical disc at the time of the data recording to an optical disc, the identification information of a self-device can be determined itself and it can record on an optical disc.

[0038]Therefore, the necessity of recording the identification information of each device by a manufacturing process to CD-R / RW drive device using a special device is lost, and complicated management of the device identification information at the time of manufacture becomes unnecessary.

[0039]Generating of a random number is started with powering on, generating of a random number is stopped at the time of the data recording by the external operation from a host computer, and since the random number obtained at the time of the stop is determined as device identification information, random nature of device identification information can be ensured.

[0040]Next, in the above-mentioned processing, since it decides on the time t from a random number generation start to determination in approximately regulated time until a drive will be from the power supply ON in a ready state, it has a possibility that a recorder specific number may become the same value each time. Then, if generating of a random number is suspended and a RID code is determined when generating of a random number is continued and the eject button of an optical disc is first pushed even after the drive was in the ready state, random nature of a RID code can be ensured.

[0041]Drawing 3 is a flow chart which shows processing when recording the RID code determined at the time of discharge of an optical disc. If, as for this processing, a power supply is turned ON (powering on) at Step 11, will progress to Step 12 and CPU will start generating of the random number by the operation of a random number generation part, Pointing to the start of initializing operation to a drive, a drive starts initializing operation, such as rotation of an optical disc, lighting of the laser beam of an optical pickup, and lock on of a servo.

[0042]Progress to Step 13, and CPU supervises operation of a drive and a drive judges whether it is a ready state which shows that preparation of data the record and renewable was completed, [to an optical disc] If it will be in a ready state, it will be judged whether it progressed to Step 14 and the eject button (instruction button of disk discharge) was pushed.

[0043]If an eject button is pushed by judgment of Step 14, will progress to Step 15 and generating of a random number will be suspended, The value obtained at the time of the stop is determined as a recorder specific number, and the RID code which progresses to Step 16 and becomes nonvolatile memory from a manufacturer code, a model code, and a recorder specific number is stored.

[0044]It is judged whether it progressed to Step 17 and the record command of data came from the host computer via buffer control and an interface circuitry, If it comes, the data which progresses to Step 18 and is sent from a host computer will once be stored in a buffer memory via buffer control and an interface circuitry, it will send to a drive via buffer control and an interface circuitry, and a drive will write data in an optical disc.

[0045]Progressing to Step 19, CPU reads a RID code from nonvolatile memory, progresses to Step 20, sends a RID code to a drive, by drive, writes a RID code in the prescribed area of an optical disc, and ends processing.

[0046]Or when a random number generation is started with the power supply ON and an optical disc is inserted first, generating of a random number is suspended and it may be made to determine a RID code.

[0047]Drawing 4 is a flow chart which shows processing when recording the RID code determined at the time of insertion of an optical disc. If, as for this processing, a power supply is turned ON (powering on) at Step 21, will progress to Step 22 and CPU will start generating of the random number by the operation of a random number generation part, Pointing to the start of initializing operation to a drive, a drive starts initializing operation, such as rotation of an optical disc, lighting of the laser beam of an optical pickup, and lock on of a servo.

[0048]If it will progress to Step 23, it will judge whether it is a ready state which shows that CPU supervised operation of the drive and the preparation [as opposed to an optical disc in a drive / of data / **** / record and playback] completed it and it will be in a ready state, it will be judged whether it progressed to Step 24 and the optical disc was inserted.

[0049]If an optical disc is inserted by judgment of Step 24, the RID code which progresses to Step 25, suspends generating of a random number, determines the value obtained at the time of the stop as a recorder specific number, progresses to Step 26, and becomes nonvolatile memory from a manufacturer code, a model code, and a recorder specific number is stored.

[0050]It is judged whether it progressed to Step 27 and the record command of data came from the host computer via buffer control and an interface circuitry, If it comes, the data which progresses to Step 28 and is sent from a host computer will once be stored in a buffer memory via buffer control and an interface circuitry, it will send to a drive via buffer control and an interface circuitry, and a drive will write data in an optical disc.

[0051]Progressing to Step 29, CPU reads a RID code from nonvolatile memory, progresses to Step 30, sends a RID code to a drive, by drive, writes a RID code in the prescribed area of an optical disc, and ends processing.

[0052]Thus, since generating of a random number is suspended and the value at that time is determined as a recorder specific number when an eject button is first pushed after the power supply ON, or when an optical disc is inserted in the beginning, Whenever [the] it calls it the depression of an eject button, and the inserting operation of an optical disc, by the artificial operation from which timing differs, it can decide on random number generation time, the recorder specific number to an optical disc can be changed each time, and random nature of a RID code can be ensured.

[0053]Next, the CD R/RW disk device of other embodiments of this invention is explained. Drawing 5 is a block diagram showing the composition of the CD R/RW disk device of other embodiments of this invention, gives identical codes to the portion which is common in drawing 1, and omits that explanation. A random number generation part is not provided in CPU11 of this CD R/RW disk device, but CPU11 obtains the temporal data generated by the real time timer 2a of the host computer 2, and determines that temporal data as a recorder specific number.

[0054]Namely, the above-mentioned CPU11, buffer control and an interface circuitry 12, and the nonvolatile memory 14, The function of the real-time-information acquisition means which acquires the real time information generated with the above-mentioned host computer is achieved, The function of a device-identification-information recording device in which the above-mentioned CPU11, the nonvolatile memory 14, and the drive 10 record the real time information acquired by the real-time-information acquisition means on the above-mentioned optical disc as device identification information of the device concerned is achieved.

[0055]The host computer 2 achieves the function which gives the temporal data which becomes a basis of the RID code to the CD R/RW disk device 1 in connection with this invention. That is, the host computer 2 searches for the real time information at the time of manufacture of the optical disk recording device which records data on an optical disc, or an inspection, and achieves the function which gives the real time information to an optical disk recording device as device identification information of an optical disk recording device. The function which adds the information which shows the factory place or inspecting place of the above-mentioned optical disk recording device to the above-mentioned device identification information is also achieved.

[0056]Next, the recording processing of the RID code to the optical disc in this CD R/RW disk device 1 is explained. For example, in the inspection process after manufacture of this CD R/RW disk device 1, At the time of the inspection of the CD R/RW disk device 1 which connected the host computer 2. The temporal data generated in the real time timer 2a is made into the recorder specific number of the CD R/RW disk device 1, the RID code which consists of the recorder specific number, manufacturer code, and model code is created, and it transmits to the CD R/RW disk device 1.

[0057]CPU11 of the CD R/RW disk device 1 will memorize the RID code to the nonvolatile memory 14, if the RID code based on the temporal data generated in the real time timer 2a of the host computer 2 via buffer control and the interface circuitry 12 is acquired.

[0058]Drawing 6 is a figure showing an example of the format of a RID code based on real time data. This RID code stores the recorder specific number set to I7-I12 of the last from the real time data of the time second at the time of an inspection in the model code set to I1-I3 of a head from a machine type number and years in manufacturer codes, such as a manufacturer name and a production-line name, the following I4-I6, respectively.

[0059]Thus, can give easily the RID code which is the identification information of the device concerned to a CD R/RW disk device using a host computer, and since the RID code is not a serial number, To a CD R/RW disk device, a special device cannot be used by a manufacturing process, but the complicatedness on the production control at the time of manufacture can be canceled. When giving the RID code to a CD R/RW disk device simultaneously at two or more places at the time of manufacture, what gives the same RID code can be prevented.

[0060]In this way, the CD R/RW disk device 1 writes in the RID code memorized by the nonvolatile memory 14 as it is at the time of the data recording over an optical disc. Therefore, CPU of a CD R/RW disk device can reduce complicated processing in which a random number determines a recorder specific number each time.

[0061]Next, since the storage location of a RID code is easily known if a RID code is memorized to the nonvolatile memory 14 made to mount independently on PCB like the above-mentioned CD R/RW disk device 1, there is a possibility that a RID code may be altered unjustly or it may be removed. Then, it is good for the storage location of a RID code to make visual recognition impossible from the exterior.

[0062]Drawing 7 is a block diagram when the nonvolatile memory which stores a RID code in the inside of CPU is built in. As shown in the figure, the core based CPU 20 and the nonvolatile memory 21 are built in the inside of CPU11, and the RID code based on the random number generated by the core based CPU 20 is stored in the nonvolatile memory 21.

[0063]For example, the core based CPU 20 will start generating of a random number, if a power supply is turned ON, and it points to the start of initializing operation to the drive 10, and the drive 10 starts initializing operation, such as rotation of the optical disc 15, lighting of the laser beam of an optical pickup, and lock on of a servo.

[0064]When the core based CPU 20 will supervise operation of the drive 10 and it will be in the ready state [as opposed to the optical disc 15 in the drive 10 / of data / ready state / record and playback], Generating of a random number is suspended, the value obtained at the time of the stop is determined as a recorder specific number, and a manufacturer code, a model code, and the RID code that consists of recorder specific numbers are stored in the nonvolatile memory 21.

[0065]Then, when the record command of data comes from the host computer 2 via buffer control and the interface circuitry 12, The data sent from the host computer 2 is once stored in the buffer memory 13 via buffer control and the interface circuitry 12, it sends to the drive 10 via buffer control and the interface circuitry 12, and the drive 10 writes data in the optical disc 15.

[0066]And the core based CPU 20 reads a RID code from the nonvolatile memory 21, sends a RID code to the drive 10, and writes a RID code in the prescribed area of the optical disc 15 by the drive 10.

[0067]Thus, since the nonvolatile memory which stores a RID code was built in CPU which manages control of the whole device, the storage location of a RID code can be made hard to recognize from the outside, and it can avoid changing a RID code unjustly. Therefore, the validity of the work which specifies the recorder of a copying illegally illegally agency using a RID code can be maintained.

[0068]

[Effect of the Invention]As explained above, according to the grant method of device identification information for the optical disk recording device and optical disk recording device by this invention, a special device cannot be used by a manufacturing process, but the device identification information which does not need the complicated management at the time of manufacture can be recorded.

[Translation done.]

CLAIMS

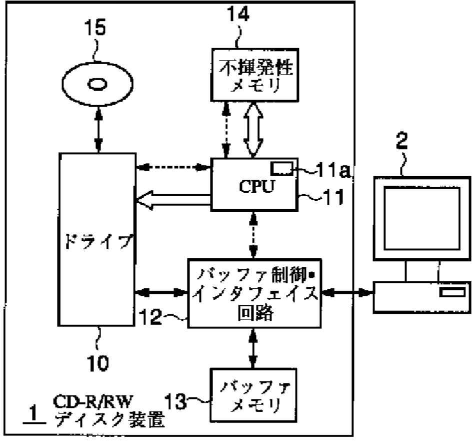
[Claim(s)]
[Claim 1]An optical disk recording device which connects a host computer and records data to an optical disc based on directions from the host computer, comprising:
A random number generation means to generate a random number.
A device-identification-information determination means to determine a random number generated by this means as identification information of the device concerned.
A device-identification-information recording device which records device identification information determined by this means on said optical disc.

[Claim 2]In the optical disk recording device according to claim 1, said device-identification-information determination means, An optical disk recording device being a means to determine a random number which was made to start generating of a random number of said random number generation means with powering on, made suspend generating of a random number of said random number generation means when performing prescribed operation by external operation, and was obtained at the time of this stop as device identification information.
[Claim 3]An optical disk recording device characterized by said prescribed operation being the disk discharging operation first performed after powering on in the optical disk recording device according to claim 2.
[Claim 4]An optical disk recording device characterized by said prescribed operation being the disk insertion operation first performed after powering on in the optical disk recording device according to claim 2.
[Claim 5]An optical disk recording device which connects a host computer and records data to an optical disc based on directions from the host computer, comprising:
A real-time-information acquisition means which acquires real time information generated with said host computer.
A device-identification-information memory measure which memorizes real time information acquired by this means as device identification information of the device concerned.
A device-identification-information recording device which records device identification information memorized by this means on said optical disc.

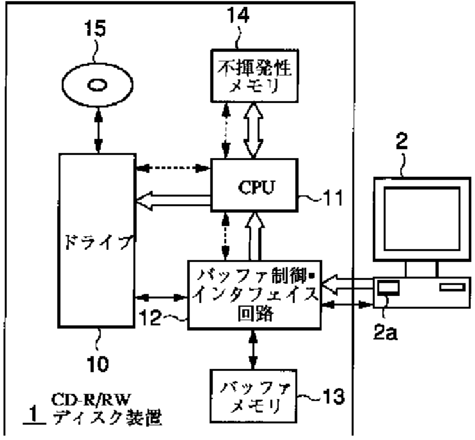
[Claim 6]An optical disk recording device making said device-identification-information memory measure build in a central processing part which controls the whole device concerned in the optical disk recording device according to any one of claims 1 to 5.
[Claim 7]A grant method of device identification information for an optical disk recording device searching for real time information at the time of manufacture of an optical disk recording device which records data on an optical disc, or an inspection, and giving the real time information to said optical disk recording device as device identification information of said optical disk recording device.
[Claim 8]A grant method of device identification information for an optical disk recording device adding information which shows a factory place or an inspecting place of said optical disk recording device to said device identification information in a grant method of device identification information for the optical disk recording device according to claim 7.
[Translation done.]

DRAWINGS

[Drawing 1]


15
14
不揮発性メモリ
2
11a
CPU
11
ドライブ
バッファ制御・インタフェイス回路
12
10
13
バッファメモリ
1 CD-R/RW ディスク装置

[Drawing 5]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ドライブ
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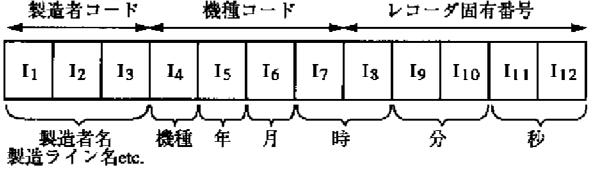
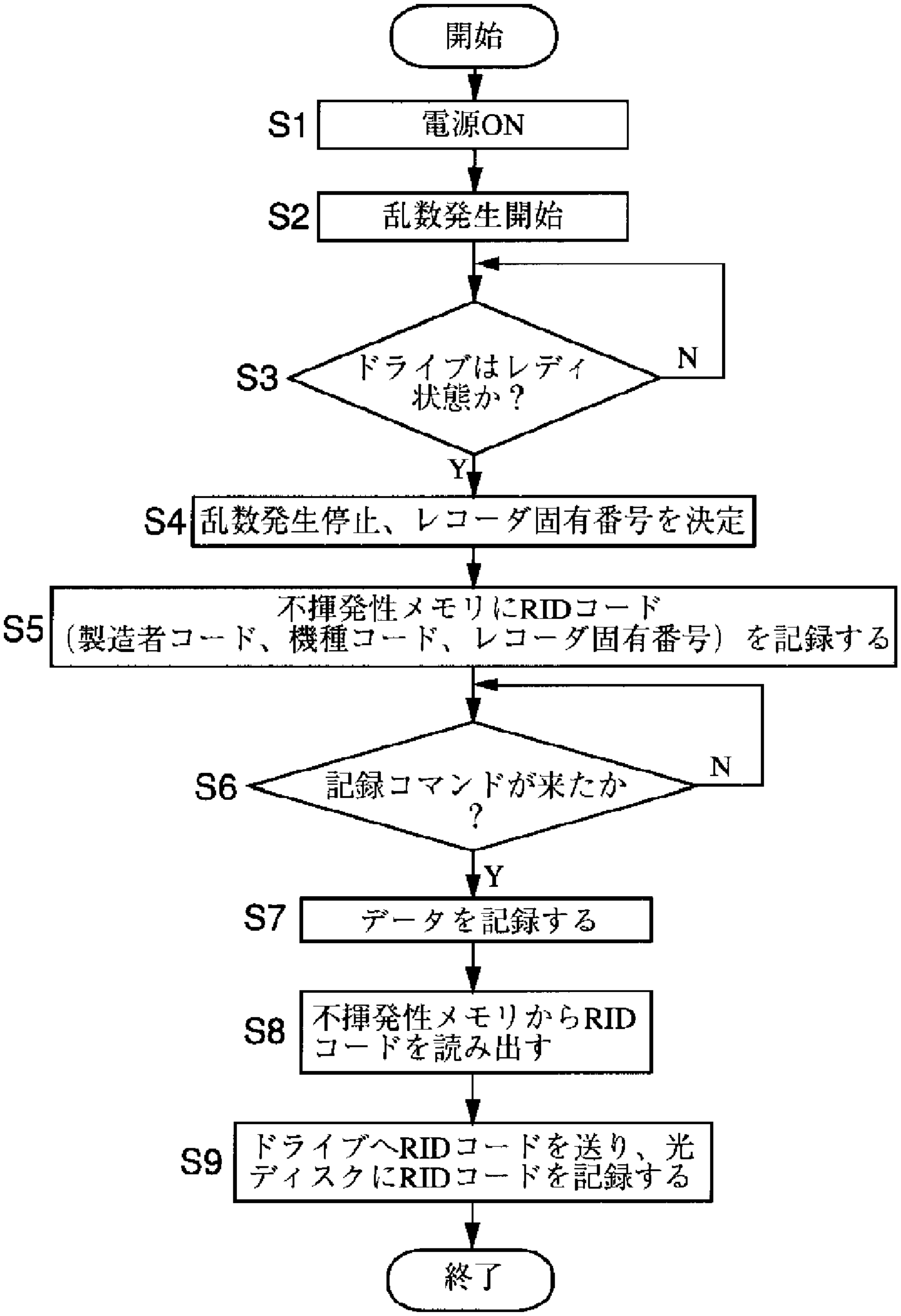
1 CD-R/RW ディスク装置

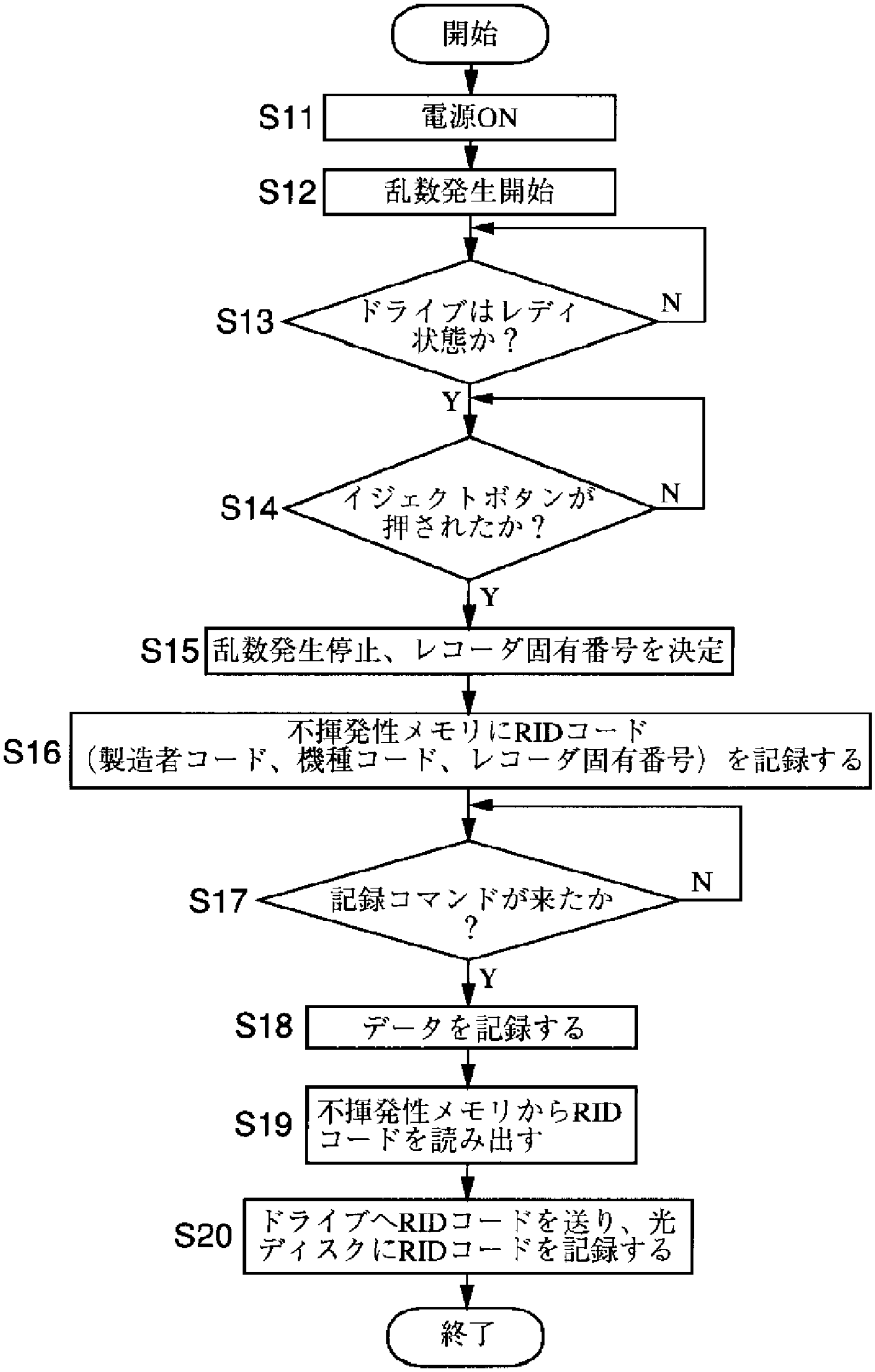
[Drawing 6]


製造者コード
機種コード
レコーダ固有番号
I_1
I_2
I_3
I_4
I_5
I_6
I_7
I_8
I_9
I_{10}
I_{11}
I_{12}
製造者名
製造ライン名etc.
機種
年
月
時
分
秒

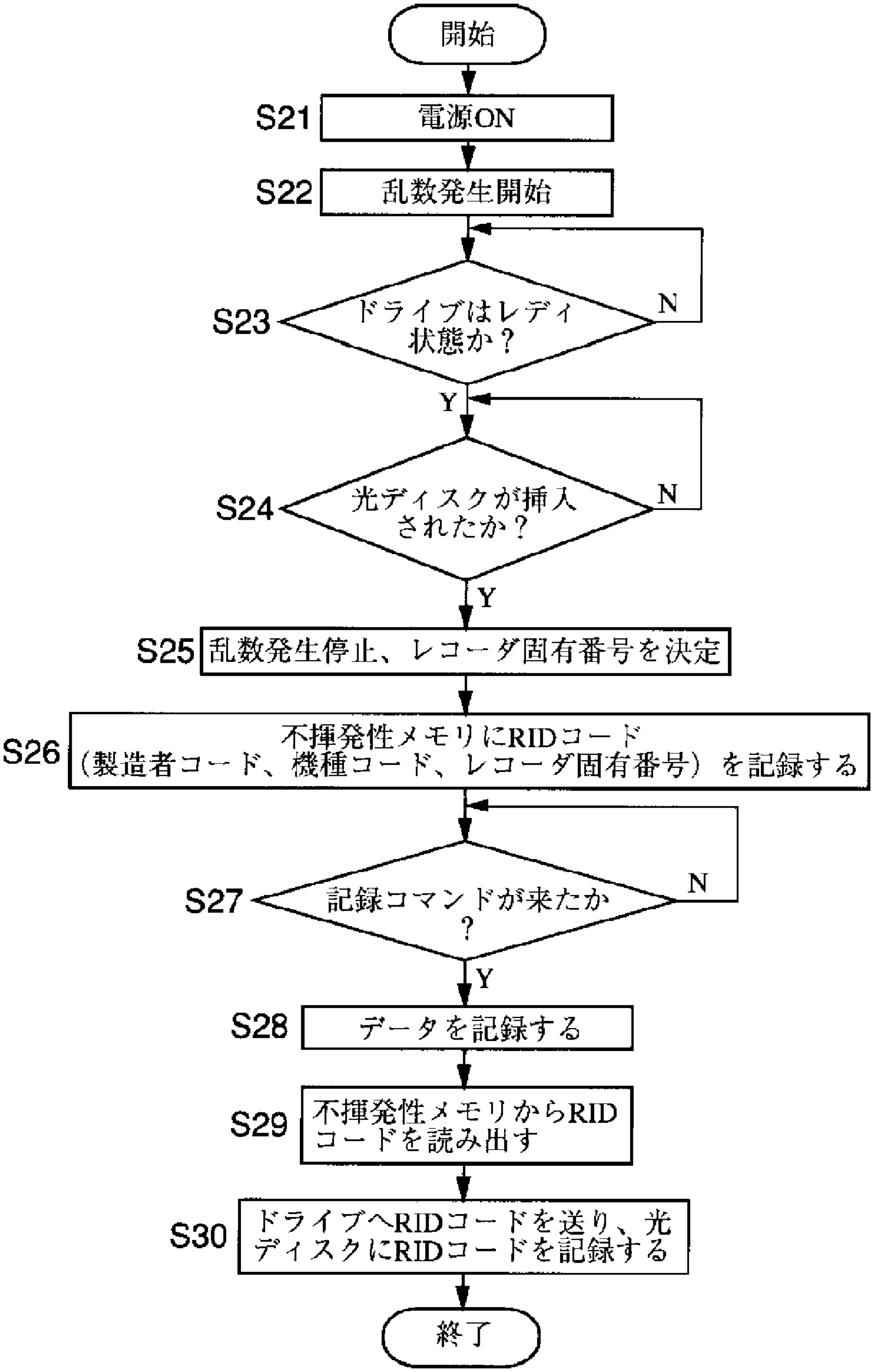
[Drawing 2]


開始
S1
電源ON
S2
乱数発生開始
S3
ドライブはレディ状態か？
N
Y
S4
乱数発生停止、レコーダ固有番号を決定
S5
不揮発性メモリにRIDコード（製造者コード、機種コード、レコーダ固有番号）を記録する
S6
記録コマンドが来たか？
N
Y
S7
データを記録する
S8
不揮発性メモリからRIDコードを読み出す
S9
ドライブへRIDコードを送り、光ディスクにRIDコードを記録する
終了

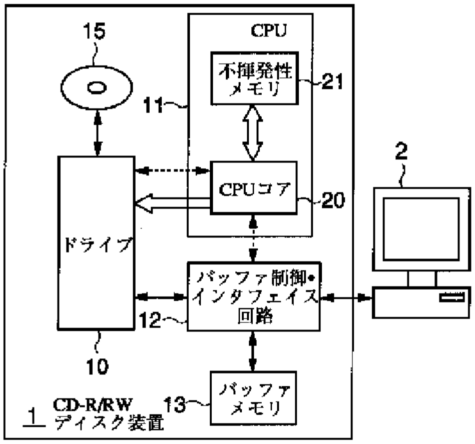
[Drawing 3]


開始
S11
電源ON
S12
乱数発生開始
S13
ドライブはレディ状態か？
N
Y
S14
イジェクトボタンが押されたか？
N
Y
S15
乱数発生停止、レコーダ固有番号を決定
S16
不揮発性メモリにRIDコード（製造者コード、機種コード、レコーダ固有番号）を記録する
S17
記録コマンドが来たか？
N
Y
S18
データを記録する
S19
不揮発性メモリからRIDコードを読み出す
S20
ドライブへRIDコードを送り、光ディスクにRIDコードを記録する
終了

[Drawing 4]


開始
S21
電源ON
S22
乱数発生開始
S23
ドライブはレディ状態か？
N
Y
S24
光ディスクが挿入されたか？
N
Y
S25
乱数発生停止、レコーダ固有番号を決定
S26
不揮発性メモリにRIDコード（製造者コード、機種コード、レコーダ固有番号）を記録する
S27
記録コマンドが来たか？
N
Y
S28
データを記録する
S29
不揮発性メモリからRIDコードを読み出す
S30
ドライブへRIDコードを送り、光ディスクにRIDコードを記録する
終了

[Drawing 7]


15
CPU
不揮発性メモリ
21
11
2
CPUコア
20
ドライブ
バッファ制御・インタフェイス回路
12
10
1
CD-R/RW ディスク装置
13
バッファメモリ

[Translation done.]